SIXTH FIVE-YEAR REVIEW REPORT
FOR
KUMMER SANITARY LANDFILL SUPERFUND SITE
BELTRAMI COUNTY, MINNESOTA

Prepared by

U.S. Environmental Protection Agency
Region 5
Chicago, Illinois

3/6/2018

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Signed by: DOUGLAS BALLOTTI

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LIST OF ABBREVIATIONS & ACRONYMS

ARAR	Applicable or Relevant and Appropriate Requirement
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CLP	Closed Landfill Program
EPA	United States Environmental Protection Agency
FYR	Five-Year Review
GWAOC	Groundwater Area of Concern
HBV	Health-Based Value
HRL	Health Risk Limit
ICs	Institutional Controls
µg/L	Micrograms per liter
MCL	Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goal
MDH	Minnesota Department of Health
Minn. Rule	Minnesota Administrative Rule
MGAOC	Methane Gas Area of Concern
MPCA	Minnesota Pollution Control Agency
MW	Monitoring Well
NPL	National Priorities List
O&M	Operation and Maintenance
OU	Operable Unit
PFAS	Per- and polyfluoroalkyl substances
PFCs	Perfluorinated Chemicals
PFOA	Perfluorooctanoic Acid
PFOS	Perfluorooctanoic Acid
RAL	Risk Action Level
RAO	Remedial Action Objectives
RI	Remedial Investigation
ROD	Record of Decision
RPM	Remedial Project Manager
SARA	Superfund Amendments and Reauthorization Act of 1986
Site	Kummer Sanitary Landfill Superfund Site
TBC	To be Considereds
TCE	Trichloroethene
UU/UE	Unlimited Use and Unrestricted Exposure
VISL	Vapor Intrusion Screening Level

I. INTRODUCTION

The purpose of a Five-Year Review (FYR) is to evaluate the implementation and performance of a remedy in order to determine if the remedy is and will continue to be protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in FYR reports such as this one. In addition, FYR reports identify issues found during the review, if any, and document recommendations to address them.

The United States Environmental Protection Agency (EPA) is preparing this FYR pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121, consistent with the National Contingency Plan (NCP)(40 CFR Section 300.430(f)(4)(ii)), and considering EPA policy.

This is the sixth FYR for the Kummer Sanitary Landfill Superfund Site (the Site). The triggering action for this statutory review is the completion date of the previous FYR. The FYR has been prepared due to the fact that hazardous substances, pollutants, or contaminants remain at the site above levels that allow for unlimited use and unrestricted exposure (UU/UE).

The Site consists of three operable units (OUs), all of which will be addressed in this FYR. OU1 addresses the alternate water supply remedy, OU2 addresses the source control remedy, and OU3 addresses the groundwater remedy. The Minnesota Pollution Control Agency (MPCA) is the lead agency managing cleanup of the Site under Minnesota's Closed Landfill Program (CLP). EPA conducts FYRs for the Site in accordance with an agreement between EPA and the Minnesota Pollution Control Agency (MPCA).

The Kummer Sanitary Landfill Superfund Site FYR was led by Leah Evison, EPA Remedial Project Manager. Participants included Cheryl Allen, EPA Community Involvement Coordinator, and the following participants from MPCA: Deborah Fideldey, Land Manager; Dave Oakes, Hydrogeologist; Ben Klismith, Engineer, and Roger Tix, Field Representative. The review began on 8/11/2017.

Site Background

The Site is located near the intersection of Anne Street NW (Highway 52) and Greenleaf Avenue NW, immediately north of the corporate limit of Bemidji, Minnesota and approximately one mile west of Lake Bemidji (Figure 1, Appendix B). Land use near the Site consists of a mix of residential, commercial, and open-space uses. The Site is a former landfill which accepted mixed municipal waste and demolition debris for disposal from 1971 to 1985 and contains about 750,000 cubic yards of mixed waste. The current waste footprint covers approximately 20 acres. Waste disposal at the landfill caused groundwater contamination that moved off-site beneath residential properties.

FIVE-YEAR REVIEW SUMMARY FORM

SITE IDENTIFICATION		
Site Name: Kummer Sanitary Landfill		
EPA ID: MND981090483		
Region: 5	**State:** MN	**City/County:** Northern Township/Beltrami County

SITE STATUS	
NPL Status: Deleted	
Multiple OUs? Yes	**Has the site achieved construction completion?** Yes

REVIEW STATUS
Lead agency: EPA
Author name: Leah Evison
Author affiliation: EPA
Review period: 8/11/2017 - 1/29/2018
Date of site inspection: 11/6/2017
Type of review: Statutory
Review number: 6
Triggering action date: 3/11/2013
Due date *(five years after triggering action date)*: 3/11/2018

II. RESPONSE ACTION SUMMARY

Basis for Taking Action

MPCA completed a Remedial Investigation (RI) for the Site in 1985. The RI documented that landfill wastes and groundwater beneath the Site were contaminated by a variety of organic and inorganic contaminants. Contaminants of concern in groundwater included methylene chloride, vinyl chloride, toluene, and trichloroethene (TCE). Contaminants of concern in landfill wastes included vinyl chloride, benzene, tetrachloroethylene, lead, polychlorinated biphenyls, and polycyclic aromatic hydrocarbons. The risk pathways that formed the basis for action at the Site were potential ingestion of groundwater and potential human exposure to landfill wastes.

Response Actions

On June 12, 1985, EPA signed a Record of Decision (ROD) for OU1, with the concurrence of MPCA. The OU1 ROD does not identify explicit Remedial Action Objectives (RAOs), but the ROD Declaration indicates that its purpose is to supply an alternate water supply for affected residents.

The ROD Declaration for OU1 describes the major remedy components as follow:

- Provisions for an alternate water supply for the affected residents in Northern Township, Minnesota consisting of constructing two wells in a deep uncontaminated aquifer, a water tower and distribution system. The location of the new wells will be in an area unaffected by the landfill; and
- First year operation and maintenance (O&M) costs to provide the labor, power and chemical supplies for the recommended alternative.

The response actions for OU1 are complete.

On September 29, 1988, EPA signed a ROD for OU2, with concurrence from MPCA. The OU2 ROD does not identify explicit RAOs, but the Scope and Role of Operable Unit section of the ROD describes the purpose as controlling the source of contaminants emanating from the landfill.

The Scope and Role of Operable Unit section of the OU2 ROD describes the major remedy components as follows:

- Site grading and consolidation of waste material;
- Placement of a sloping foundation layer of 1-15 feet of existing and proposed natural soil fill;
- Capping with a cover system consisting of a 0.5-foot gas control layer, a 2.0-foot barrier layer of low permeable material (clay) or a 0.30-millimeter flexible membrane, and a 1.0-foot drainage layer;
- A 1.5-foot topsoil, cover soil, gas control and vegetation layer to provide protection of the drainage and barrier layers;
- Deed restrictions limiting future use of the Site;
- Fencing to restrict access to the Site; and
- Long-term O&M to provide inspections and repairs to the landfill cap.

The response actions for OU2 are complete with the exception of ongoing O&M.

On September 28 and 29, 1990, MPCA and EPA, respectively, signed a ROD for OU3. The Selected Remedy Section of the ROD describes the goal of the remedial action as aquifer restoration to a drinking water aquifer.

The Applicable or Relevant and Appropriate Requirements (ARARs) and to-be-considereds (TBCs) for the Site are summarized in the following table:

Table 1: Groundwater ARARs and TBCs Summary Table

ARARs	TBCs
Federal Maximum Contaminant Levels (MCLs) and Maximum Contaminant Level Goals (MCLGs) under the Safe Drinking Water Act, as amended (relevant and appropriate)	State Risk Action Levels (RALs) established by the Minnesota Department of Health (MDH)
Federal Ambient Water Quality Criteria for the Protection of Aquatic Life (AWQCs) under the Clean Water Act, as amended (relevant and appropriate)	State surface water quality standards for Lake Bemidji and the Mississippi River under Minn. Rules Ch. 7050

The State of Minnesota no longer uses RALs. MDH has established Health Risk Limits (HRLs) and Health-Based Values (HBVs) for evaluating the safety of private drinking water supplies. HRLs are promulgated values and HBVs are values that MDH intends to promulgate in the near future. In this FYR, groundwater results are compared to MCLs, HRLs, HBVs, and surface water quality standards.

The OU3 ROD Declaration section describes the major remedy components as follows:

- Extraction of contaminated ground water;
- Treatment of contaminated ground water by advanced oxidation processes; and
- Discharge of treated groundwater using an infiltration pond.

On August 15, 1995, MPCA signed a ROD Amendment for the OU3 ROD, and EPA signed on November 21, 1995. The OU3 ROD Amendment Declaration section describes the amended remedy as follows:

- Installation of a pilot scale field demonstration to determine the feasibility of in-situ biodegradation of the chemicals of concern;
- Installation of a full scale in-situ bioremediation system after one year of operation if it is necessary to meet the MCL for chemicals of concern. This is dependent on the field scale demonstration proving effective at lowering contaminant levels that have not yet reached the appropriate cleanup goal. If the pilot scale field demonstration is determined to be infeasible, an active gas extraction system will be designed and installed;
- Long-term monitoring of groundwater to verify that chemicals of concern are continuing to decline and to measure the performance of the pilot scale field demonstration and/or full scale *in-situ* bioremediation system;
- Continued observance of the MDH Well Advisory which regulates the location of future potable wells near the Site; and
- Institutional Controls (ICs) in the form of Site access restrictions that protect the remedy; and O&M of the remedy, including periodic inspection of the Site to ensure protectiveness.

On May 26, 2009, EPA, with the concurrence of MPCA, signed an Explanation of Significant Difference (ESD) for the OU3 ROD to document that installation of a full-scale *in-situ* bioremediation system was not feasible or necessary and that a passive, rather than active, gas extraction system was protective.

The OU3 ROD ESD describes the modified remedy as follows:

- Pilot-scale field demonstration to determine feasibility of *in-situ* biodegradation of the chemicals of concern completed by MPCA in 1997;
- Installation of the full-scale *in-situ* bioremediation system to meet MCLs for chemicals of concern was found to not be feasible or necessary. The MCL for vinyl chloride has been met. An active gas extraction system is also no longer necessary. The landfill now has a passive gas venting system consisting of 34 deep vertical vents. In addition, there are 16 gas monitoring probes surrounding the landfill, which are sampled three times a year to monitor for landfill gas migration;
- Long-term monitoring of groundwater to verify that chemicals of concern are continuing to decline;
- Continued observance of the MDH Well Advisory which regulates the location of future potable wells near the Site;
- Continued ICs in the form of Site access restrictions that protect the remedy; and
- O&M of the remedy, including periodic inspection of the Site to ensure protectiveness.

The response actions required by the ROD for OU3, as modified, are complete with the exception of ongoing groundwater monitoring and monitoring of ICs. As described in the Issues and Recommendations section of this FYR, additional response actions to address the vapor intrusion pathway may be needed.

Status of Implementation

Construction of the OU1 remedy for an alternate water supply was completed in 1991. Construction included two new deep-water wells and a water distribution system. A total of 198 connections to individual homes, businesses, and a mobile home park were completed for this OU. The new system was an extension of the City of Bemidji water supply. An IC for groundwater (Special Well Construction Area) was implemented in 1991 and remains in place.

Construction of the OU2 source control remedy was completed in 1992. It included waste consolidation, a multi-layer cap (the clay capping option was selected), and fencing. An IC for OU2 (Landfill Cleanup Agreement Declaration of Restrictions and Covenants dated October 6, 1995) was recorded by Beltrami County on October 18, 1995.

Construction of a pilot-scale bioremediation system for OU3 groundwater was conducted following the 1995 ROD Amendment. A full-scale treatment system was not found feasible or necessary. Groundwater monitoring continues at this OU. EPA signed a Preliminary Closeout Report on June 22, 2000, to document that remedy construction at the Site was completed.

In 1994, the Site was deferred to MPCA and entered into the CLP. On October 16, 1995, MPCA entered into a Landfill Cleanup Agreement with Charles Kummer, Jon Kummer and Ruth Kummer. On April 26, 1996, following issuance of a Notice of Compliance by MPCA, EPA deleted the Site from the NPL, as specified by the deferral agreement between EPA and MPCA. Since contaminants remain at the Site above levels that allow for UU/UE, EPA continues to conduct FYRs to ensure that the Site remedy remains protective of human health and the environment.

Institutional Controls

Table 2: Institutional Controls Summary Table

Media, engineered controls, and areas that do not support UU/UE based on current conditions	ICs Needed	ICs Called for in the Decision Documents	Impacted Parcel(s)	IC Objective	Title of IC Instrument Implemented and Date
Soil - Landfill capped area and surrounding monitoring systems	Yes	Yes	See Fig. 2, App. B	Prohibits any use that disturbs the integrity of the final cover, liners and any other component of the containment system or monitoring systems except as approved by MPCA	Landfill Cleanup Agreement Declaration of Restrictions and Covenants dated October 6, 1995 and recorded by Beltrami County October 18, 1995
Soil – Adjacent parcels: "Road Parcel to North 40", "Kummer's House Parcel", and "remaining property owned by Ruth Kummer (now Kummer Landholding Co LLC) in the Northwest Quarter of Section 32, Township 147N, Range 33W, Northern Township, Beltrami County, Minnesota"	Yes	Yes	See App. D	Prohibits construction within 100 feet of the landfill without written approval of MPCA	Landfill Cleanup Agreement Declaration of Restrictions and Covenants dated October 6, 1995 and recorded by Beltrami County October 18, 1995
Groundwater – West half of the northeast quarter, Section 32, Township 147N, Range 33W, Northern Township, Beltrami County, Minnesota	Yes	Yes	See Fig. 3, App. B	Drinking water wells may only be installed in compliance with Minn. Rule 4725.4450 and after written approval of MPCA and MDH	Landfill Cleanup Agreement Declaration of Restrictions and Covenants dated October 6, 1995 and recorded by Beltrami County October 18, 1995
Groundwater – Special Well and Boring Construction Area	Yes	Yes	See App. D	Detailed prohibitions and requirements for new and existing wells and borings intended to prevent ingestion of groundwater that exceeds drinking water standards and prevent the expansion of a groundwater plume	Northern Township Special Well and Boring Construction Area (Minn. Rules, part 4725.3650) updated January 15, 2010
Groundwater – area within 600 feet of landfill	Yes	Yes	See Fig. 3, App. B	Prohibits construction of new water-supply well within 300 feet of a mixed municipal solid waste landfill, or 600 feet for a sensitive water-supply well*	Minnesota Administrative Rule 4725.4450

*Minnesota Rules define "sensitive water-supply well" as a water-supply well with less than 50 feet of watertight casing where the casing does not penetrate a confining layer or penetrate multiple layers of confining materials with an aggregate thickness of 10 feet or more.

Parcel descriptions and maps showing the area in which the ICs apply are included in Appendix D.

Status of Access Restrictions and ICs:

ICs for soil and groundwater are currently in place for the Site as listed in Table 2. There have been no changes to the ICs during the period of this FYR.

Current Compliance:

MPCA reports that based on site inspections there have been no instances of non-compliance during the period of this FYR.

IC Follow up Actions Needed:

Long-term protectiveness requires continued compliance with the land and groundwater use restrictions to ensure that the remedy continues to function as intended. Implementation of the long-term stewardship (LTS) plan, developed in January 2018, will ensure that the ICs are maintained, monitored and enforced, as discussed below.

Long Term Stewardship:

Since compliance with ICs is necessary to ensure the protectiveness of the remedy, planning for LTS is required to ensure that the ICs are maintained, monitored and enforced so that the remedy continues to function as intended. On January 9, 2018, MPCA developed a LTS plan for the Site that ensures periodic review of ICs, specifies actions to be taken, and includes annual reporting to EPA.

Zoning and Informational Devices

Although not ICs, other additional safeguards and informational devices have been implemented and updated at the Site. On March 14, 2012, the Greater Bemidji Area Joint Planning Board issued a zoning overlay which further protects land use at the Site (Appendix D).

MPCA designates a Methane Gas Area of Concern (MGAOC) and a Groundwater Area of Concern (GWAOC) for each CLP site (Figures 2 and 3, Appendix B). MPCA posts links to the AOCs on its website to inform local residents and well drillers, and shares the maps with the MDH's Well Management Unit which is responsible for permitting well construction. MPCA sends updated GWAOC and MGAOC maps to local units of government when the maps are updated. At the Site, the AOC maps were last updated in 2017.

Systems Operations/Operation & Maintenance

Landfill Cover System

The upgraded landfill cover, installed in 1988, is inspected for erosion or other damage and repairs are made when and where necessary to maintain integrity. MPCA's field representative is on-Site approximately three times per year to observe landfill conditions. Maintenance includes maintaining proper slopes for positive drainage of the fill area and annual mowing by an MPCA contractor.

Landfill Gas Control System

The landfill currently includes a passive gas venting system. The current venting system consists of 37 vertical gas wells installed in 2008. Currently, 26 gas probes are located around the landfill perimeter (Figure 2, Appendix B). The probes are more densely located in areas with adjacent residential or commercial property. MPCA's goal is to sample gas probes at the Site two times per year, and to increase the frequency if methane is detected. Gas probe locations and sampling results are discussed in the Data Review section of this FYR report.

Groundwater Monitoring System

The groundwater monitoring system currently includes 32 monitoring wells in 16 locations (Figure 3, Appendix B). MPCA currently samples groundwater at the Site for volatile organic compounds twice per year and metals every three to five years. Emerging contaminants (1,4-doioxane and per- and poly-fluoroalkyl substances or PFAS) have begun to be sampled at the Site. Monitoring wells are regularly inspected and replaced when necessary. Groundwater monitoring results are discussed in the Data Review section of this FYR report.

III. PROGRESS SINCE THE LAST REVIEW

This section includes the protectiveness determinations and statements from the last FYR as well as the recommendations from the last FYR and the current status of those recommendations.

Table 3: Protectiveness Determination/Statement from the 2013 FYR

OU #	Protectiveness Determination	Protectiveness Statement
1	Protective	The remedy at OU1 is protective of human health and the environment. The exposure pathways that could result in unacceptable risks are being controlled by the alternate drinking water supply provided for local residents. Institutional controls are in place and effective.
2	Short-term Protective	The remedy at OU2 is currently protective of human health and the environment in the short-term because there is no evidence of a cap breach, ICs are in place and effective, and current on-Site uses are consistent with the objectives of the ICs. The OU 2 remedy will achieve long-term protectiveness when the long-term stewardship of ICs is ensured by completion of the Closed Landfill Use Plan.

3	Short-term Protective	The remedy at OU3 is currently protective of human health and the environment in the short-term because the groundwater plume is stable and groundwater use restrictions are in place. Institutional controls are in place and effective. The OU3 remedy will achieve long-term protectiveness when groundwater cleanup standards are achieved throughout the plume.
Sitewide	Short-term Protective	The remedy for the Site is currently protective of human health and the environment in the short-term because an alternate water supply was constructed for local residents, there is no evidence of a cap breach, the groundwater plume is stable, and existing Site uses are consistent with the objectives of the land and groundwater use restrictions. Institutional controls are in place and effective. The remedy will achieve long-term protectiveness when groundwater cleanup standards are achieved throughout the plume and the Closed Landfill Use Plan is completed.

Table 4: Status of Recommendation from the 2013 FYR

OU #	Issue	Recommendations	Current Status	Current Implementation Status Description	Completion Date (if applicable)
2	Long-term stewardship of ICs would be improved by completion of a Land-Use Plan	Complete Land-Use Plan	Completed	Updated Area of Concern maps and descriptions* shared with City, MDH, and the public; Long-Term Stewardship Plan completed by MPCA	1/9/2018

*As discussed further in the IC Section of this FYR, these maps and descriptions inform the City, MDH and the public regarding areas where land or groundwater use should be restricted.

IV. FIVE-YEAR REVIEW PROCESS

Community Notification, Involvement & Site Interviews

A public notice entitled *EPA Begins Review of Kummer Sanitary Landfill Superfund Site* was published in the Bemidji Pioneer on November 19, 2017, stating that there was a FYR and inviting the public to submit comments to EPA. No comments were received in response to the notice. The results of the review and the report will be made available at the offices of MPCA located at 520 Lafayette Road North, St. Paul, Minnesota and on EPA's website. The Site has been deferred to MPCA's CLP which involves the public as appropriate. No interviews other than with MPCA staff were conducted for this FYR.

Data Review

OU1

City of Bemidji drinking water supply wells are located west/southwest (upgradient) of the Site. On May 23, 2017, MDH issued an updated health-based advisory for two industrial chemicals present in groundwater in Bemidji: perfluorooctanoic acid (PFOA) and perfluorooctanoic acid (PFOS). PFOA and

PFOS are two types of perfluorinated chemicals (PFCs). MDH has indicated that the Bemidji-area groundwater contamination is associated with PFCs in fire-fighting foam used at the community's airport over the years. The Bemidji Regional Airport is located approximately one mile west (upgradient) of the Site. City water supply wells are also located west/southwest (upgradient) of the landfill. Low levels of several PFAS (below drinking water standards) have been detected in a monitoring well downgradient of the Site, as discussed under OU3 below.

OU2

MPCA currently monitors a system of 26 gas probes at the Site (Figure 2, Appendix B). During the period of this FYR, MPCA sampled all the gas probes at the Site one to two times per year, and new probes installed south of the Site additional times in 2014, in order to further define the MGAOC south of the Site. Sampling results are shown in Table 7 in Appendix B.

During the period of this FYR, concentrations of methane gas that exceed the lower explosive limit (LEL) of approximately 5% have been detected multiple times in three probes at the Site: MS-3 and MS-14, located west of the landfill, and MS-9, located east of the landfill. Methane gas was also detected sporadically in several additional probes in 2013 (once each in MS-1, located south of the landfill, and MS-25, located west of the landfill).

West of the landfill, in areas not located near buildings, methane concentrations up to 10% have been detected, although concentrations ranging from non-detect to values below the LEL (5%) are also found during other sampling events at the same probes. East of the landfill, concentrations up to 8.7% were detected in 2013, although since that time, concentrations have ranged from non-detect to 2.6% (below the LEL). Additional gas probes located between each of the probes with detections above the LEL and nearby residential and commercial properties showed methane to be non-detect during the same sampling event.

Although there have been some methane exceedances, the overall results indicate that the passive gas extraction system is operating successfully at most locations and that generally landfill gas is not migrating outside of the MGAOC. However, a recommendation has been added to this FYR that MPCA evaluate ways to improve methane venting at the Site.

OU3

Comparison to Drinking Water Standards

MPCA monitors a system of 34 groundwater monitoring wells at the Site and one nearby private well used for non-drinking uses such as lawn watering (Figure 3, Appendix B). During the period of this FYR, vinyl chloride, 1,4-doxane, arsenic and manganese exceeded drinking water standards downgradient of the Site. Maximum concentrations of these contaminants during the most recent round of sampling (generally November 2017) are shown in Table 5 below.

Table 5: Highest Groundwater Exceedances in Most Recent Sampling Round (2017)

Contaminant	**Concentration** (µg/L*)	**Location**	**Drinking Water Standard** (µg/L)
vinyl chloride	0.94	MW-27A	0.2 (HRL)
1,4-dioxane	1.1	MW-26D	0.035 (MCL)
arsenic	480**	MW-CR	10 (MCL)
manganese	6400	MW-2B	100 (HRL)

*Micrograms per liter (µg/L)
**This result is anomalous at the Site. More commonly arsenic concentrations remain below 20 µg/L.

All exceedances of drinking water standards during the period of this FYR are listed in Table 8 in Appendix B of this FYR. Results from the most recent round of sampling (2017) are summarized below:

- Vinyl chloride exceeded its lowest drinking water standard (HRL) at two wells, both located near the waste boundary. Concentrations of this contaminant continue to be stable or declining at the Site.
- 1,4-dioxane exceeded the drinking water concentration that EPA's Integrated Risk Information System (IRIS) indicates represents 1 x 10^{-6} cancer risk if used for drinking water, at seven wells located between the waste boundary and approximately 400 feet east. MPCA plans to sample additional wells to define the boundary of this plume when financing allows.
- Arsenic exceeded its lowest drinking water standard (MCL) at six wells located between the waste boundary and approximately 500 feet southeast. With the exception of the MW-CR, located near the waste boundary, concentrations of this contaminant also continue to be stable or declining at the Site.
- Manganese exceeded its lowest drinking water standard (HRL) at 24 wells, located throughout the plume. However, manganese is a naturally-occurring element at this Site and also exceeds drinking water standards in wells located upgradient of the Site.

In 2016, MPCA sampled the group of emerging contaminants known as PFAS. A well cluster upgradient of the Site (MW-5A, B, and C) and a well cluster at the downgradient (eastern) boundary of the landfill (MW-2A and B) were sampled. Of the sampled wells, PFAS was only detected in the shallowest downgradient well (MW-2A). The detected PFAS concentrations were all between the laboratory reporting limit and method detection limit, so are estimated values, as listed below:

Table 6: PFAS Detections at Monitoring Well MW-2A

Compound	Result (µg/L)	MDH HRL (µg/L)	EPA Health Advisory Level
Perfluorobutanoic acid (PFBA)	0.009	7	**
Perfluorohexanoic acid (PFHxA)	0.021	*	**
Perfluorooctanoic acid (PFOA)	0.016	0.035	0.00007

*MDH has established a risk assessment advice level for PFHxA as non-detect.
**Not available.

It is not known whether the landfill is a source of the PFAS in groundwater at the Site. As stated above, MDH has indicated that the Bemidji-area groundwater contamination is associated with PFCs in fire-fighting foam used at the community's airport over the years, which is located approximately one mile west (upgradient) of the Site. City water supply wells are also located west/southwest (upgradient) of the Site. MDH reports that PFOA and another PFAS known as PFOS have been detected in Bemidji area groundwater upgradient of the Site. MPCA plans PFAS sampling at additional monitoring wells at the Site in 2018.

Comparison to Vapor Intrusion Screening Values

The CLP is in the process of formulating policies regarding evaluation of vapor intrusion risk. For this FYR, shallow groundwater results were compared to EPA's vapor intrusion screening levels (VISLs) for groundwater using default risk parameters of 1×10^{-6} cancer risk and a hazard index of 1. Shallow groundwater downgradient of the landfill exceeds the VISL for vinyl chloride of 0.15 µg/L at MW-2A, MW-3A, MW-7A, MW-26S, MW-27A, MW-28A, and MW-C. All but one of these wells (MW-7A) are located near the eastern or southern boundary of the landfill waste. With the exception of MW-7A, wells located near where the plume underlies buildings do not exceed a VISL. EPA's VISLs are conservative screening values and do not necessarily indicate that there is unacceptable risk from vapor intrusion. In this case, however, the exceedances do indicate that vapor sampling should be conducted, and mitigation implemented if needed. This has been added to the recommendations section of this FYR. EPA recommends that MPCA begin this evaluation as soon as possible, recognizing that frequently sampling in multiple seasons may be needed.

Comparison to Surface Water Criteria

Groundwater downgradient of the landfill discharges to Lake Bemidji approximately one mile east of the landfill. Lake Bemidji is located within the Mississippi River-Headwaters watershed and the Mississippi River flows through the lake. For this FYR, groundwater sampling results from the two most downgradient monitoring well nests (MW-18 and MW-24) were compared to Class 2 surface water quality criteria for aquatic life and recreational use. At the MW-18 nest, no Site-related contaminants were detected. At MW-24B, groundwater contains low levels of ethyl ether, chloroethane and vinyl chloride (below drinking water standards). No State or federally recommended surface water quality criteria have been established for the first two of these contaminants, but Minnesota has established a water quality standard of 0.17µg/L in Class 2 waters. The concentration of vinyl chloride in MW-24B is well below this value (0.077 µg/L in 2017). In addition, it is likely that significant reductions, potentially to non-detect levels, of these contaminants occur prior to groundwater discharging to the lake.

Site Inspection

The inspection of the Site was conducted on November 6, 2017. In attendance were Deborah Fideldey and Roger Tix of MPCA. The EPA RPM was unable to attend the inspection due to a non-work-related injury. The purpose of the inspection was to assess the protectiveness of the remedy. The inspection form is available in Appendix C of this FYR. MPCA was not able to take photos during the inspection.

Minor settlement and cracking were observed on the landfill, but no ponding or deep cracking was observed which would indicate significant settlement or breaching of the cap. Letdown channels were in good condition. The vegetated landfill cover showed minimal signs of stress (normal for this northern environment). No issues were observed with regard to the operation of the landfill, gas venting system or the groundwater monitoring system. Landfill fence and gates were in good condition.

V. TECHNICAL ASSESSMENT

QUESTION A: Is the remedy functioning as intended by the decision documents?

Question A Summary:

Yes.

The remedial actions for all OUs are functioning substantially as intended. However, this FYR makes recommendations for OU2 and OU3.

The remedial action for OU1, alternate water supply, was constructed in1987-1990, and water supply wells are located upgradient and unaffected by the landfill. The remedial action for OU2, source containment, is mostly effective, however, this FYR recommends that MPCA evaluate ways to improve gas venting at the Site. The remedial action for OU3, monitored natural attenuation, is performing as expected for historically-known Site-related contaminants. Cleanup levels for these contaminants are expected to be achieved in a reasonable time frame. However, the plume has not been fully defined for 1,4-dioxane or PFAS compounds which are known to be present in groundwater at the Site, and the FYR recommends that the plume be further defined for these contaminants.

O&M procedures, as implemented, will maintain the effectiveness of the remedies. There have not been frequent equipment breakdowns or other changes that may indicate a potential protectiveness-affecting issue. MPCA continues to monitor the site for possible optimization and cost savings.

Access controls, including fencing, and monitoring well locks, are in place and are effectively preventing exposure to contaminated materials. ICs are also in place and are effective at the Site.

QUESTION B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid?

Question B Summary:

Yes.

The ROD established groundwater cleanup goals as federal MCLs, with state health-based limits for drinking water (currently HRLs) as TBC cleanup levels. The ROD did not establish cleanup goals at a specific numeric level. MPCA compares groundwater monitoring results to current MCLs and HRLs.

EPA's VISLs have been lowered since the time of the last FYR and this FYR recommends that MPCA conduct additional evaluation of this pathway and implement mitigation if needed. In addition, 1,4-dioxane and several PFAS compounds have been discovered in groundwater at the Site and this FYR recommends that MPCA complete additional monitoring that is already planned. Land-use near the Site continues to consist of residential, commercial, and open space uses. The remedy is progressing as expected towards meeting RAOs.

QUESTION C: Has any other information come to light that could call into question the protectiveness of the remedy?

No.

No other information has come to light that could call into question the protectiveness of the remedy.

VI. ISSUES/RECOMMENDATIONS

Issues/Recommendations
OU(s) without Issues/Recommendations Identified in the Five-Year Review:
1

Issues and Recommendations Identified in the Five-Year Review:				
OU: 2	**Issue Category: Operations and Maintenance**			
	Issue: Concentrations of methane above the lower explosive limit are periodically detected in gas probes, although other probes demonstrate the current protectiveness of the remedy			
	Recommendation: Evaluate ways to improve gas venting at the Site and implement where needed.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	State	EPA	7/31/2018

OU: 3	**Issue Category: Changed Site Conditions**			
	Issue: Shallow groundwater near the landfill contains vinyl chloride at levels exceeding EPA vapor intrusion screening levels, although wells nearest to buildings do not.			
	Recommendation: Conduct soil gas sampling to confirm the lack of vapor intrusion risk at the Site, and implement mitigation measures if needed.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	State	EPA	3/31/2020

OU: 3	**Issue Category: Monitoring**			
	Issue: The downgradient extent of the groundwater plume has not been defined for 1,4-dioxane or PFAS compounds			
	Recommendation: Define the plume for 1,4-dioxane and PFAS compounds downgradient of the Site and determine whether the Site is a source.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	State	EPA	3/31/2020

VII. PROTECTIVENESS STATEMENTS

Protectiveness Statement(s)	
Operable Unit:	*Protectiveness Determination:*
1	Protective
Protectiveness Statement:	
The remedy at OU1 is protective of human health and the environment. The exposure pathways that could result in unacceptable risks are being controlled by the alternate drinking water supply provided for local residents. Institutional controls are in place and effective.	

Protectiveness Statement(s)	
Operable Unit:	*Protectiveness Determination:*
2	Short-term Protective
Protectiveness Statement:	
The remedy at OU2 currently protects human health and the environment because the landfill cap and passive gas collection system are in place and being effectively maintained, gas probes adjacent to residences demonstrate current protectiveness, and land use controls are in place and effective. However, in order for the remedy to be protective in the long-term, the following actions need to be taken to ensure protectiveness: evaluate ways to improve gas venting at the Site and implement where needed.	

Protectiveness Statement(s)	
Operable Unit:	*Protectiveness Determination:*
3	Short-term Protective
Protectiveness Statement:	
The remedy at OU3 currently protects human health and the environment because the groundwater plume is stable and groundwater-use restrictions are in place and effective. However, in order for the remedy to be protective in the long-term, the following actions need to be taken to ensure protectiveness: conduct soil gas sampling to confirm a lack of vapor intrusion risk at the Site and implement mitigation measures if needed; and define the plume for 1,4-dioxane and PFAS compounds downgradient of the Site and determine whether the Site is a source.	

Sitewide Protectiveness Statement
Protectiveness Determination: Short-term Protective
Protectiveness Statement: The remedy for the Site currently protects human health and the environment because an alternate water supply was constructed for local residents, there is no evidence of a cap breach, the groundwater plume is stable, existing Site uses are consistent with the objectives of the land and groundwater-use restrictions, and institutional controls are in place and effective. However, in order for the remedy to be protective in the long-term, the following actions need to be taken to ensure protectiveness: evaluate ways to improve gas venting at the Site and implement where needed; conduct soil gas sampling to confirm a lack of vapor intrusion risk at the Site and implement mitigation measures if needed; and define the plume for 1,4-dioxane and PFAS compounds downgradient of the Site and determine whether the Site is a source.

VIII. NEXT REVIEW

The next FYR report for the Kummer Sanitary Landfill Superfund Site is required no less than five years from EPA's signature date of this review.

APPENDIX A

References

ROD for Kummer Sanitary Landfill (OU1), signed by EPA June 12, 1985

ROD for Kummer Sanitary Landfill (OU2), signed by EPA September 30, 1988

ROD for Kummer Sanitary Landfill (OU3), signed by EPA September 29, 1990

ROD Amendment for Kummer Sanitary Landfill (OU3), signed by EPA November 21, 1995

ESD for Kummer Sanitary Landfill (OU3), signed by EPA May 26, 2009

Five-Year Review for Kummer Sanitary Landfill, signed by EPA March 11, 2013

Methane gas monitoring data supplied by MPCA

Groundwater monitoring data supplied by MPCA

APPENDIX B

Figures

Figure 1. Site Location

Figure 2. Methane Gas Area of Concern and Location of Gas Probes

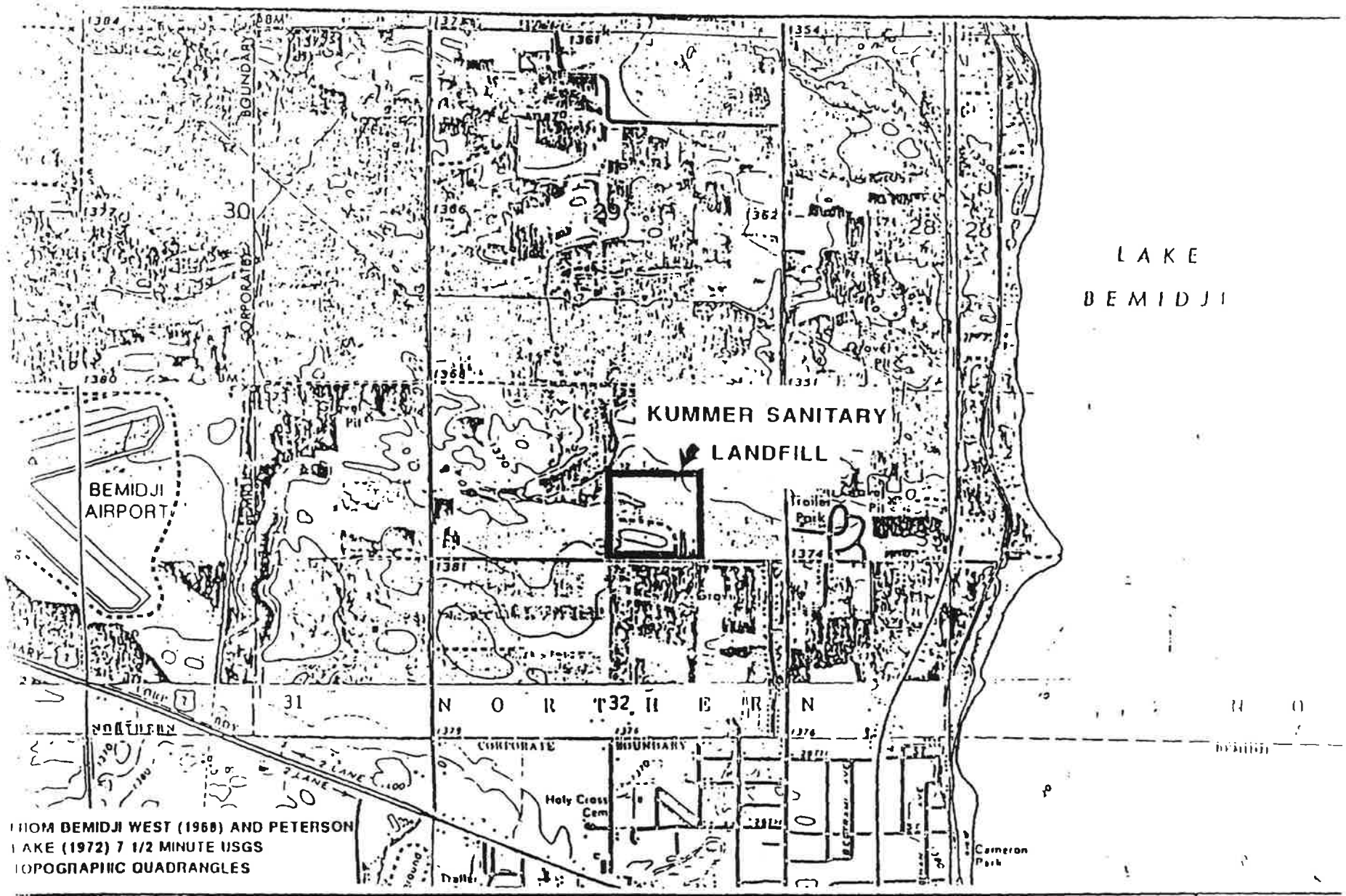
Figure 3. Groundwater Area of Concern and Location of Monitoring Wells

Tables

(Table 1 through 6 are found in text of FYR Report)

Table 7. Methane Gas Results

Table 8. Groundwater Monitoring Results



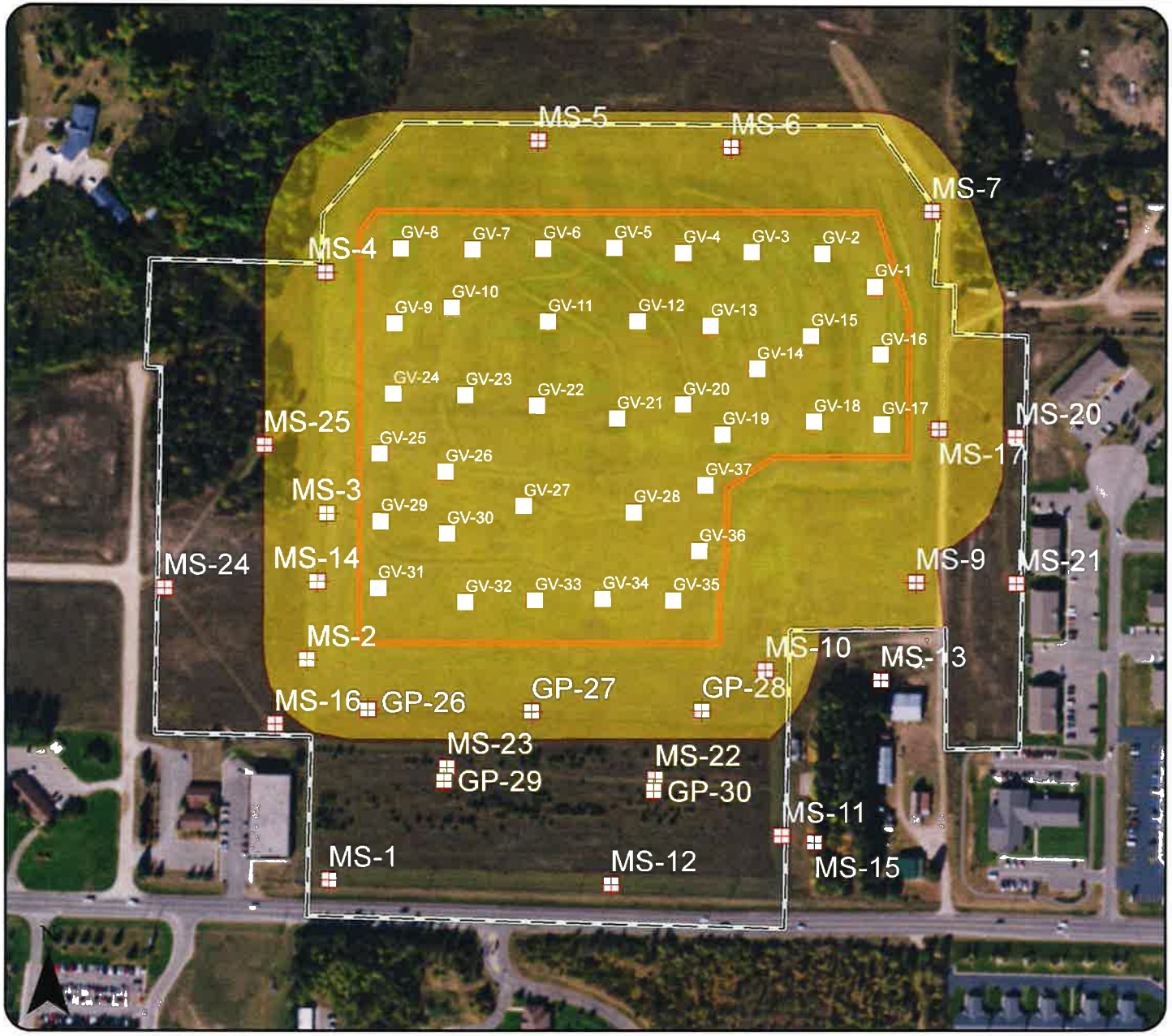
MALCOLM PIRNIE

KUMMER LANDFILL
SITE LOCATION

MALCOLM PIRNIE

FIGURE 1

CLP Methane Area of Concern: Kummer Landfill



DISCLAIMER: The State of Minnesota makes no representations or warranties to the user as to the accuracy, currency, suitability or reliability of this data for any purpose. This map depicts a reasonable approximation of impacts from the landfill only and makes no inference about impacts from other potential sources.

1:3,690

Meters 0 40 80 120

Feet 0 170 340 510

MINNESOTA POLLUTION CONTROL AGENCY

Site Contacts

Land Manager: Deborah Fideldy
Engineer: Ben Klismith
Hydrogeologist: Dave Oakes

Date Updated: 11/7/2017

Site Features

- Gas Passive Vent
- Gas Probe
- Waste Footprint
- **Land Management Area** *Designates the property that is under the responsibility and control of the MPCA for the purpose of taking environmental response actions.*
- **Methane Area of Concern** *Area surrounding the landfill that may be impacted by subsurface migration of methane gas.*

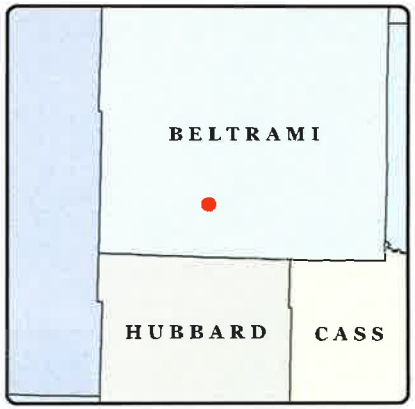
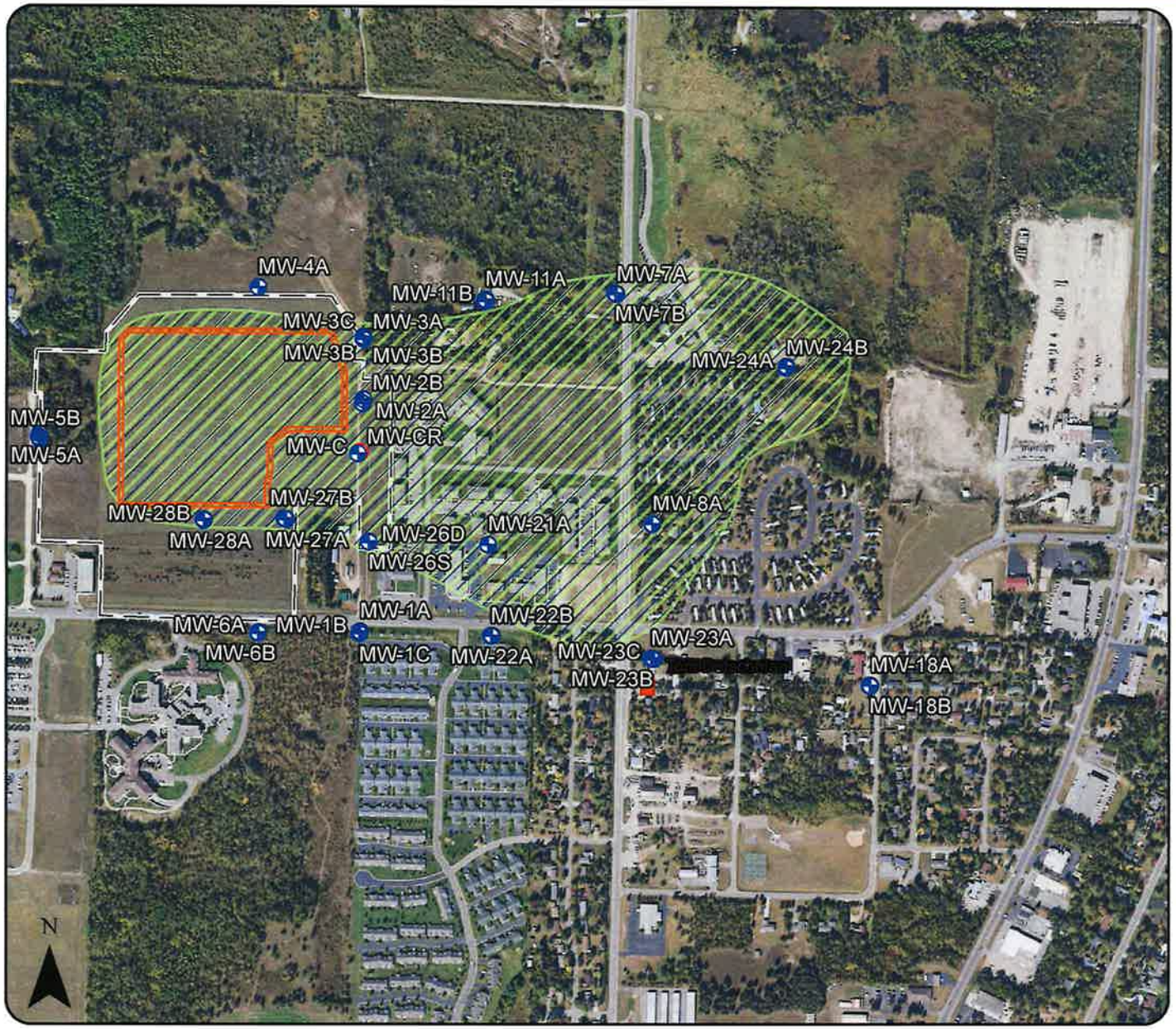


Figure 2

CLP Groundwater Plume: Kummer Landfill



DISCLAIMER: The State of Minnesota makes no representations or warranties to the user as to the accuracy, currency, suitability or reliability of this data for any purpose. This map depicts a reasonable approximation of impacts from the landfill only and makes no inference about impacts from other potential sources.

1:9,290

Meters 0 130 260 390

Feet 0 325 650 975

Figure 3

MINNESOTA POLLUTION CONTROL AGENCY

Site Contacts

Land Manager: Deborah Fideldy
Engineer: Ben Klismith
Hydrogeologist: Dave Oakes
Date Updated:11/30/2017

Site Features

- **Waste Footprint**
- **Groundwater Plume**
- **Land Management Area**
  Designates the property that is under the responsibility and control of the MPCA for the purpose of taking environmental response actions.

Monitoring Well

- **Sealed (1)**
- **Active (37)**
- **Residential Monitoring Well**

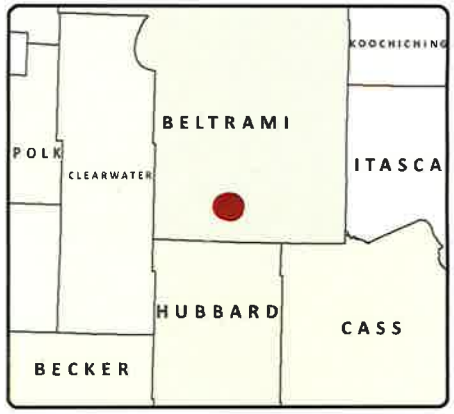


Table 7. Methane Gas Results with Detections Highlighted (%)		
PROBE	**DATE**	**RESULT**
MS-1	1/3/2012	0
MS-10	1/3/2012	0
MS-11	1/3/2012	0
MS-12	1/3/2012	0
MS-13	1/3/2012	0
MS-14	1/3/2012	0
MS-15	1/3/2012	0
MS-16	1/3/2012	0
MS-17	1/3/2012	0
MS-2	1/3/2012	0
MS-20	1/3/2012	0
MS-21	1/3/2012	0
MS-22	1/3/2012	0
MS-23	1/3/2012	0
MS-24	1/3/2012	0
MS-25	1/3/2012	0
MS-3	1/3/2012	0
MS-4	1/3/2012	0
MS-5	1/3/2012	0
MS-6	1/3/2012	0
MS-7	1/3/2012	0
MS-9	1/3/2012	0
MS-1	**8/30/2013**	**8.3**
MS-10	8/30/2013	0
MS-11	8/30/2013	0
MS-12	8/30/2013	0
MS-13	8/30/2013	0
MS-14	**8/30/2013**	**9.2**
MS-15	8/30/2013	0
MS-16	8/30/2013	0
MS-17	8/30/2013	0
MS-2	8/30/2013	0
MS-20	8/30/2013	0
MS-21	8/30/2013	0
MS-22	**8/30/2013**	**0.2**
MS-23	8/30/2013	0
MS-24	8/30/2013	0
MS-25	**8/30/2013**	**0.6**
MS-3	**8/30/2013**	**8.1**
MS-4	8/30/2013	0
MS-5	8/30/2013	0
MS-6	8/30/2013	0
MS-7	8/30/2013	0
MS-9	**8/30/2013**	**8.7**
GP-026	11/25/2013	0
GP-027	11/25/2013	0
GP-028	11/25/2013	0
GP-029	11/25/2013	0
GP-030	11/25/2013	0
GP-26D	11/25/2013	0
GP-27D	11/25/2013	0
GP-28D	11/25/2013	0
GP-29D	11/25/2013	0
GP-30D	11/25/2013	0
MS-1	11/25/2013	0
MS-10	11/25/2013	0
MS-11	11/25/2013	0
MS-12	11/25/2013	0
MS-13	11/25/2013	0
MS-14	11/25/2013	0
MS-15	11/25/2013	0
MS-16	11/25/2013	0
MS-17	11/25/2013	0
MS-2	11/25/2013	0
MS-20	11/25/2013	0
MS-21	11/25/2013	0
MS-22	11/25/2013	0
MS-23	11/25/2013	0
MS-24	11/25/2013	0
MS-25	11/25/2013	0
MS-3	11/25/2013	0
MS-4	11/25/2013	0
MS-5	11/25/2013	0
MS-6	11/25/2013	0
MS-7	11/25/2013	0
MS-9	**11/25/2013**	**3.7**
GP-026	1/23/2014	0
GP-027	1/23/2014	0
GP-028	1/23/2014	0
GP-029	1/23/2014	0
GP-030	1/23/2014	0
GP-26D	1/23/2014	0
GP-27D	1/23/2014	0
GP-28D	1/23/2014	0
GP-29D	1/23/2014	0
GP-30D	1/23/2014	0
MS-1	1/23/2014	0
MS-12	1/23/2014	0
MS-22	1/23/2014	0
MS-23	1/23/2014	0
GP-026	2/24/2014	0
GP-027	2/24/2014	0
GP-028	2/24/2014	0
GP-029	2/24/2014	0
GP-030	2/24/2014	0

GP-26D	2/24/2014	0
GP-27D	2/24/2014	0
GP-28D	2/24/2014	0
GP-29D	2/24/2014	0
GP-30D	2/24/2014	0
MS-1	2/24/2014	0
MS-12	2/24/2014	0
MS-22	2/24/2014	0
MS-23	2/24/2014	0
GP-026	3/11/2014	0
GP-027	3/11/2014	0
GP-028	3/11/2014	0
GP-029	3/11/2014	0
GP-030	3/11/2014	0
GP-26D	3/11/2014	0
GP-27D	3/11/2014	0
GP-28D	3/11/2014	0
GP-29D	3/11/2014	0
GP-30D	3/11/2014	0
MS-1	3/11/2014	0
MS-12	3/11/2014	0
MS-22	3/11/2014	0
MS-23	3/11/2014	0
GP-026	3/18/2014	0
GP-027	3/18/2014	0
GP-028	3/18/2014	0
GP-029	3/18/2014	0
GP-030	3/18/2014	0
GP-26D	3/18/2014	0
GP-27D	3/18/2014	0
GP-28D	3/18/2014	0
GP-29D	3/18/2014	0
GP-30D	3/18/2014	0
MS-1	3/18/2014	0
MS-12	3/18/2014	0
MS-22	3/18/2014	0
MS-23	3/18/2014	0
GP-026	3/21/2014	0
GP-027	3/21/2014	0
GP-028	3/21/2014	0
GP-029	3/21/2014	0
GP-030	3/21/2014	0
GP-26D	3/21/2014	0
GP-27D	3/21/2014	0
GP-28D	3/21/2014	0
GP-29D	3/21/2014	0
GP-30D	3/21/2014	0
MS-1	3/21/2014	0
MS-12	3/21/2014	0
MS-22	3/21/2014	0
MS-23	3/21/2014	0
GP-026	4/1/2014	0
GP-027	4/1/2014	0
GP-028	4/1/2014	0
GP-029	4/1/2014	0
GP-030	4/1/2014	0
GP-26D	4/1/2014	0
GP-27D	4/1/2014	0
GP-28D	4/1/2014	0
GP-29D	4/1/2014	0
GP-30D	4/1/2014	0
MS-1	4/1/2014	0
MS-12	4/1/2014	0
MS-22	4/1/2014	0
MS-23	4/1/2014	0
GP-026	6/11/2014	0
GP-027	6/11/2014	0
GP-028	6/11/2014	0
GP-029	6/11/2014	0
GP-030	6/11/2014	0
GP-26D	6/11/2014	0
GP-27D	6/11/2014	0
GP-28D	6/11/2014	0
GP-29D	6/11/2014	0
GP-30D	6/11/2014	0
MS-1	6/11/2014	0
MS-10	6/11/2014	0
MS-11	6/11/2014	0
MS-12	6/11/2014	0
MS-13	6/11/2014	0
MS-14	6/11/2014	0
MS-15	6/11/2014	0
MS-16	6/11/2014	0
MS-17	6/11/2014	0
MS-2	6/11/2014	0
MS-20	6/11/2014	0
MS-21	6/11/2014	0
MS-22	6/11/2014	0
MS-23	6/11/2014	0
MS-24	6/11/2014	0
MS-25	6/11/2014	0
MS-3	6/11/2014	0
MS-4	6/11/2014	0
MS-5	6/11/2014	0
MS-6	6/11/2014	0
MS-7	6/11/2014	0
MS-9	6/11/2014	0
GP-026	10/22/2014	0

GP-027	10/22/2014	0
GP-028	10/22/2014	0
GP-029	10/22/2014	0
GP-030	10/22/2014	0
GP-26D	10/22/2014	0
GP-27D	10/22/2014	0
GP-28D	10/22/2014	0
GP-29D	10/22/2014	0
GP-30D	10/22/2014	0
MS-1	10/22/2014	0
MS-10	10/22/2014	0
MS-11	10/22/2014	0
MS-12	10/22/2014	0
MS-13	10/22/2014	0
MS-14	10/22/2014	1.4
MS-15	10/22/2014	0
MS-16	10/22/2014	0
MS-17	10/22/2014	0
MS-2	10/22/2014	0
MS-20	10/22/2014	0
MS-21	10/22/2014	0
MS-22	10/22/2014	0
MS-23	10/22/2014	0
MS-24	10/22/2014	0
MS-25	10/22/2014	0
MS-3	10/22/2014	0.8
MS-4	10/22/2014	0
MS-5	10/22/2014	0
MS-6	10/22/2014	0
MS-7	10/22/2014	0
MS-9	10/22/2014	0.2
GP-026	8/27/2015	0
GP-027	8/27/2015	0
GP-028	8/27/2015	0
GP-029	8/27/2015	0
GP-030	8/27/2015	0
GP-26D	8/27/2015	0
GP-27D	8/27/2015	0
GP-28D	8/27/2015	0
GP-29D	8/27/2015	0
GP-30D	8/27/2015	0
MS-1	8/27/2015	0
MS-10	8/27/2015	0
MS-11	8/27/2015	0
MS-12	8/27/2015	0
MS-13	8/27/2015	0
MS-14	8/27/2015	1.5
MS-15	8/27/2015	0
MS-16	8/27/2015	0

MS-17	8/27/2015	0
MS-2	8/27/2015	0
MS-20	8/27/2015	0
MS-21	8/27/2015	0
MS-22	8/27/2015	0
MS-23	8/27/2015	0
MS-24	8/27/2015	0
MS-25	8/27/2015	0
MS-3	8/27/2015	4.4
MS-4	8/27/2015	0
MS-5	8/27/2015	0
MS-6	8/27/2015	0
MS-7	8/27/2015	0
MS-9	8/27/2015	1.2
MS-1	5/17/2016	0
MS-2	5/17/2016	0
MS-3	5/17/2016	0
MS-4	5/17/2016	0
MS-5	5/17/2016	0
MS-6	5/17/2016	0
MS-7	5/17/2016	0
MS-9	5/17/2016	0
GP-027	10/6/2016	0
GP-028	10/6/2016	0
GP-029	10/6/2016	0
GP-030	10/6/2016	0
GP-27D	10/6/2016	0
GP-28D	10/6/2016	0
GP-29D	10/6/2016	0
GP-30D	10/6/2016	0
MS-1	10/6/2016	0
MS-10	10/6/2016	0
MS-11	10/6/2016	0
MS-12	10/6/2016	0
MS-13	10/6/2016	0
MS-14	10/6/2016	2.8
MS-15	10/6/2016	0
MS-16	10/6/2016	0
MS-17	10/6/2016	0
MS-2	10/6/2016	0
MS-20	10/6/2016	0
MS-21	10/6/2016	0
MS-22	10/6/2016	0
MS-23	10/6/2016	0
MS-24	10/6/2016	0
MS-25	10/6/2016	0
MS-3	10/6/2016	10
MS-4	10/6/2016	0
MS-5	10/6/2016	0

MS-6	10/6/2016	0
MS-7	10/6/2016	0
MS-9	10/6/2016	2.6

Table 8. Groundwater Exceedances of Drinking Water Standards or Other Health-Based Level (excluding manganese) ug/L						
WELL	**DATE**	**CHEMICAL**	**RESULT**	**MCL**	**HRL**	**OTHER**
MW-2B	9/20/2016	1,4-Dioxane	1.1		1	0.35 (IRIS)
MW-2B	9/20/2016	1,4-Dioxane	1.1		1	0.35 (IRIS)
MW-2A	9/20/2016	1,4-Dioxane	2.3		1	0.35 (IRIS)
MW-26S	9/20/2016	1,4-Dioxane	0.91		1	0.35 (IRIS)
MW-24B	6/26/2017	1,4-Dioxane	0.56		1	0.35 (IRIS)
MW-7A	6/26/2017	1,4-Dioxane	0.43		1	0.35 (IRIS)
MW-8A	6/26/2017	1,4-Dioxane	0.37		1	0.35 (IRIS)
MW-26D	11/20/2017	1,4-Dioxane	1.1		1	0.35 (IRIS)
MW-23C	6/26/2017	Arsenic	12.5	10		
MW-26D	6/27/2017	Arsenic	19.1	10		
MW-27A	6/27/2017	Arsenic	24.4	10		
MW-27B	6/27/2017	Arsenic	26.7	10		
MW-28B	6/27/2017	Arsenic	61.9	10		
MW-2A	6/27/2017	Arsenic	24.5	10		
MW-CR	6/27/2017	Arsenic	480	10		
MW-3A	6/10/2013	Vinyl chloride	0.33	2	0.2	
MW-2A	6/10/2013	Vinyl chloride	0.5	2	0.2	
MW-2B	6/10/2013	Vinyl chloride	0.35	2	0.2	
MW-22B	6/10/2013	Vinyl chloride	0.37	2	0.2	
MW-7A	6/11/2013	Vinyl chloride	0.28	2	0.2	
MW-24B	6/11/2013	Vinyl chloride	0.28	2	0.2	
MW-26D	6/11/2013	Vinyl chloride	0.65	2	0.2	
MW-26S	6/11/2013	Vinyl chloride	0.59	2	0.2	
MW-26S	10/1/2013	Vinyl chloride	0.54	2	0.2	
MW-26D	10/1/2013	Vinyl chloride	0.3	2	0.2	
MW-2B	10/1/2013	Vinyl chloride	0.42	2	0.2	
MW-2A	10/1/2013	Vinyl chloride	0.52	2	0.2	
MW-C	10/1/2013	Vinyl chloride	1.1	2	0.2	
MW-3A	10/1/2013	Vinyl chloride	0.64	2	0.2	
MW-C	10/13/2014	Vinyl chloride	0.61	2	0.2	
MW-2A	10/14/2014	Vinyl chloride	0.45	2	0.2	
MW-2B	10/14/2014	Vinyl chloride	0.5	2	0.2	
MW-2A	10/29/2015	Vinyl chloride	0.49	2	0.2	
MW-2B	10/29/2015	Vinyl chloride	0.22	2	0.2	
MW-26D	10/30/2015	Vinyl chloride	0.21	2	0.2	
MW-2A	5/24/2016	Vinyl chloride	0.26	2	0.2	
MW-2B	5/24/2016	Vinyl chloride	0.2	2	0.2	
MW-27A	5/24/2016	Vinyl chloride	0.46	2	0.2	
MW-2B	9/20/2016	Vinyl chloride	0.29	2	0.2	
MW-2A	9/20/2016	Vinyl chloride	0.4	2	0.2	
MW-27A	9/22/2016	Vinyl chloride	0.58	2	0.2	
MW-28A	9/22/2016	Vinyl chloride	0.47	2	0.2	
MW-28B	6/27/2017	Vinyl chloride	0.31	2	0.2	
MW-27A	11/21/2017	Vinyl chloride	0.94	2	0.2	
MW-28B	11/21/2017	Vinyl chloride	0.26	2	0.2	

APPENDIX C

Site Inspection Checklist

I. SITE INFORMATION	
Site name: Kummer Sanitary Landfill	**Date of inspection:**
Location and Region: Beltrami County, MN, Region 5	**EPA ID:** MND981090483
Agency, office, or company leading the five-year review: EPA	**Weather/temperature:**

Remedy Includes: (Check all that apply)

- ☒ Landfill cover/containment
- ☒ Access controls
- ☒ Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Surface water collection and treatment
- ☒ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls
- ☒ Other___Landfill gas venting system_____

Attachments: ☐ Inspection team roster attached ☒ Site map attached (See FYR report for map)

II. INTERVIEWS

1. **O&M site manager** Deborah Fideldy (Name) | Project Manager (Title) | November 7, 2017 (Date)
   Interviewed ☐at site ☒at office ☐by phone Phone no. 651-757-2309
   Problems, suggestions; ☐Report attached _____

2. **O&M staff** Roger Tix (Name) | Field Rep (Title) | November 6, 2017 (Date)
   Interviewed: ☒at site ☐at office ☐by phone Phone no. 218-82-1445
   Problems, suggestions; ☐Report attached _____

3. **Local regulatory authorities and response agencies** (not interviewed)

   Agency _____
   Contact _____ _____ _____ _____
   Name Title Date Phone no.
   Problems; suggestions; ☐Report attached _____

   Agency _____
   Contact _____ _____ _____ _____
   Name Title Date Phone no.
   Problems; suggestions; ☐Report attached _____

   Agency _____
   Contact _____ _____ _____ _____
   Name Title Date Phone no.
   Problems; suggestions; ☐Report attached _____

   Agency _____
   Contact _____ _____ _____ _____
   Name Title Date Phone no.
   Problems; suggestions; ☐Report attached _____

4. **Other interviews** (optional) ☐ Report attached.

III. ON-SITE DOCUMENTS & RECORDS VERIFIED

1. O&M Documents

☒ O&M manual	☒ Readily available	☒ Up to date	☐ N/A
☐ As-built drawings	☐ Readily available	☐ Up to date	☒ N/A
☒ Maintenance logs	☒ Readily available	☒ Up to date	☐ N/A

Remarks____All Site documents located in the office of MPCA's Closed Landfill Program at 520 Lafayette Rd N, St. Paul MN _____

_____

2. **Site-Specific Health and Safety Plan** ☒ Readily available ☒ Up to date ☐ N/A

☒ Contingency plan/emergency response plan ☒ Readily available ☒ Up to date ☐ N/A

Remarks____MPCA's CLP program-wide health & safety protocols are used at the Site..._____

_____

3. **O&M and OSHA Training Records** ☐ Readily available ☐ Up to date ☒ N/A

Remarks_____

_____

4. **Permits and Service Agreements**

☐ Air discharge permit	☐ Readily available	☐ Up to date	☒ N/A
☐ Effluent discharge	☐ Readily available	☐ Up to date	☒ N/A
☐ Waste disposal, POTW	☐ Readily available	☐ Up to date	☒ N/A
☐ Other permits_____	☐ Readily available	☐ Up to date	☐ N/A

Remarks_____

_____

5. **Gas Generation Records** ☐ Readily available ☐ Up to date ☒ N/A

Remarks__Gas is vented, not collected_____

_____

6. **Settlement Monument Records** ☐ Readily available ☐ Up to date ☒ N/A

Remarks_____

_____

7. **Groundwater Monitoring Records** ☒ Readily available ☒ Up to date ☐ N/A

Remarks_____

_____

8. **Leachate Extraction Records** ☐ Readily available ☐ Up to date ☒ N/A

Remarks_____

_____

9. **Discharge Compliance Records**

☐ Air	☐ Readily available	☐Up to date	☒ N/A
☐ Water (effluent)	☐ Readily available	☐ Up to date	☒ N/A

Remarks_____

_____

10. **Daily Access/Security Logs** ☐ Readily available ☐ Up to date ☒ N/A

Remarks_____

_____

IV. O&M COSTS

1. **O&M Organization**

☒ State in-house ☒ Contractor for State
☐ PRP in-house ☐ Contractor for PRP
☐ Federal Facility in-house ☐ Contractor for Federal Facility
☐ Other_____
_____

2. **O&M Cost Records** (not reviewed for this Site, managed by MPCA's Closed Landfill Program)

☐Readily available ☐ Up to date
☐ Funding mechanism/agreement in place
Original O&M cost estimate_____ ☐Breakdown attached

Total annual cost by year for review period if available

From_____ To_____ _____ ☐ Breakdown attached
Date Date Total cost
From_____ To_____ _____ ☐ Breakdown attached
Date Date Total cost
From_____ To_____ _____ ☐ Breakdown attached
Date Date Total cost
From_____ To_____ _____ ☐ Breakdown attached
Date Date Total cost
From_____ To_____ _____ ☐ Breakdown attached
Date Date Total cost

3. **Unanticipated or Unusually High O&M Costs During Review Period**

Describe costs and reasons: _____
_____
_____
_____
_____
_____

V. ACCESS AND INSTITUTIONAL CONTROLS ☒ Applicable ☐ N/A

A. Fencing

1. **Fencing damaged** ☐ Location shown on site map ☒ Gates secured ☐ N/A
Remarks_____
_____

B. Other Access Restrictions

1. **Signs and other security measures** ☐ Location shown on site map ☐ N/A
Remarks__There are no, No Trespassing signs on this site, but it is fenced and the gates are locked_
_____

C. Institutional Controls (ICs)

1. **Implementation and enforcement**
Site conditions imply ICs not properly implemented ☐ Yes ☒ No ☐ N/A
Site conditions imply ICs not being fully enforced ☐ Yes ☒ No ☐ N/A

Type of monitoring (*e.g.*, self-reporting, drive by) __MPCA field inspections_____
Frequency __generally 3 times per year_____
Responsible party/agency ____MPCA_____
Contact __Deborah Fideldey_____ __Land Manager___ _____ _(651) 757-2309__
Name Title Date Phone no.

Reporting is up-to-date ☒ Yes ☐ No ☐ N/A
Reports are verified by the lead agency ☒ Yes ☐ No ☐ N/A

Specific requirements in deed or decision documents have been met ☒ Yes ☐ No ☐ N/A
Violations have been reported ☐ Yes ☒ No ☐ N/A
Other problems or suggestions: ☐ Report attached
_____
_____
_____
_____

2. **Adequacy** ☒ ICs are adequate ☐ ICs are inadequate ☒ N/A
Remarks_____
_____
_____

D. General

1. **Vandalism/trespassing** ☐ Location shown on site map ☒ No vandalism evident
Remarks_____
_____

2. **Land use changes on site** ☒ N/A
Remarks_____
_____

3. **Land use changes off site** ☒ N/A
Remarks_____
_____

VI. GENERAL SITE CONDITIONS

A. Roads ☐ Applicable ☒ N/A

1. **Roads damaged** ☐ Location shown on site map ☒ Roads adequate ☐ N/A
Remarks There are no roads on this site. To access the landfill there is a shared driveways, in adequate condition.

B. Other Site Conditions

Remarks _____

VII. LANDFILL COVERS ☐ Applicable ☐ N/A

A. Landfill Surface

1. **Settlement** (Low spots) ☐ Location shown on site map ☐ Settlement not evident
Areal extent_____ Depth_____
Remarks Minor settlement on the cover. Cover is in good condition

2. **Cracks** ☐ Location shown on site map ☐ Cracking not evident
Lengths 20-50 feet Widths 8-12 inches Depths 6-8 inches
Remarks Minor cracks in the cover, not indicative of cap breach

3. **Erosion** ☐ Location shown on site map ☒ Erosion not evident
Areal extent_____ Depth_____
Remarks_____

4. **Holes** ☐ Location shown on site map ☒ Holes not evident
Areal extent_____ Depth_____
Remarks_____

5. **Vegetative Cover** ☐ Grass ☒ Cover properly established ☐ No signs of stress
☐ Trees/Shrubs (indicate size and locations on a diagram)
Remarks Minimal signs of stress, normal for northern climate.

6. **Alternative Cover (armored rock, concrete, etc.)** ☒ N/A
Remarks_____

7. **Bulges** ☐ Location shown on site map ☒ Bulges not evident
Areal extent_____ Height_____
Remarks_____

8. **Wet Areas/Water Damage** ☒ Wet areas/water damage not evident
☐ Wet areas ☐ Location shown on site map Areal extent_____
☐ Ponding ☐ Location shown on site map Areal extent_____
☐ Seeps ☐ Location shown on site map Areal extent_____
☐ Soft subgrade ☐ Location shown on site map Areal extent_____
Remarks_____
_____

9. **Slope Instability** ☐ Slides ☐ Location shown on site map ☒ No evidence of slope instability
Areal extent_____
Remarks_____
_____

B. Benches ☐ Applicable ☒ N/A
(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

1. **Flows Bypass Bench** ☐ Location shown on site map ☐ N/A or okay
Remarks_____
_____

2. **Bench Breached** ☐ Location shown on site map ☐ N/A or okay
Remarks_____
_____

3. **Bench Overtopped** ☐ Location shown on site map ☐ N/A or okay
Remarks_____
_____

C. Letdown Channels ☒ Applicable ☐ N/A
(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. **Settlement** ☐ Location shown on site map ☒ No evidence of settlement
Areal extent_____ Depth_____
Remarks_____
_____

2. **Material Degradation** ☐ Location shown on site map ☒ No evidence of degradation
Material type_____ Areal extent_____
Remarks_____
_____

3. **Erosion** ☐ Location shown on site map ☒ No evidence of erosion
Areal extent_____ Depth_____
Remarks_____
_____

4. **Undercutting** ☐ Location shown on site map ☒ No evidence of undercutting
Areal extent_____ Depth_____
Remarks_____
_____

5. **Obstructions** Type_____ ☒ No obstructions
☐ Location shown on site map Areal extent_____
Size_____
Remarks_____
_____

6. **Excessive Vegetative Growth** Type_____
☒ No evidence of excessive growth
☐ Vegetation in channels does not obstruct flow
☐ Location shown on site map Areal extent_____
Remarks_____
_____

D. Cover Penetrations ☒ Applicable ☐ N/A

1. **Gas Vents** ☐ Active ☒ Passive
☒ Properly secured/locked ☒ Functioning ☒ Routinely sampled ☒ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A
Remarks_____
_____

2. **Gas Monitoring Probes**
☒ Properly secured/locked ☒ Functioning ☒ Routinely sampled ☒ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A
Remarks_____
_____

3. **Monitoring Wells** (within surface area of landfill)
☒ Properly secured/locked ☒ Functioning ☒ Routinely sampled ☒ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A
Remarks_____
_____

4. **Leachate Extraction Wells**
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance ☒ N/A
Remarks_____
_____

5. **Settlement Monuments** ☐ Located ☐ Routinely surveyed ☒ N/A
Remarks_____
_____

E. Gas Collection and Treatment ☐ Applicable ☒ N/A

1. **Gas Treatment Facilities**
☐ Flaring ☐ Thermal destruction ☐ Collection for reuse
☐ Good condition ☐ Needs Maintenance
Remarks_____
_____

2. **Gas Collection Wells, Manifolds and Piping**
☐ Good condition ☐ Needs Maintenance
Remarks_____
_____

3. **Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings)
☐ Good condition ☐ Needs Maintenance ☒ N/A
Remarks_____
_____

F. Cover Drainage Layer ☐ Applicable ☒ N/A

1. **Outlet Pipes Inspected** ☐ Functioning ☐ N/A
Remarks_____
_____

2. **Outlet Rock Inspected** ☐ Functioning ☐ N/A
Remarks_____
_____

G. Detention/Sedimentation Ponds ☐ Applicable ☒ N/A

1. **Siltation** Areal extent_____ Depth_____ ☐ N/A
☐ Siltation not evident
Remarks_____
_____

2. **Erosion** Areal extent_____ Depth_____
☐ Erosion not evident
Remarks_____
_____

3. **Outlet Works** ☐ Functioning ☐ N/A
Remarks_____
_____

4. **Dam** ☐ Functioning ☐ N/A
Remarks_____
_____

H. Retaining Walls ☐ Applicable ☒ N/A

1. **Deformations** ☐ Location shown on site map ☐ Deformation not evident
Horizontal displacement_____ Vertical displacement_____
Rotational displacement_____
Remarks_____
_____

2. **Degradation** ☐ Location shown on site map ☐ Degradation not evident
Remarks_____
_____

I. Perimeter Ditches/Off-Site Discharge ☐ Applicable ☒ N/A

1. **Siltation** ☐ Location shown on site map ☐ Siltation not evident
Areal extent_____ Depth_____
Remarks_____
_____

2. **Vegetative Growth** ☐ Location shown on site map ☐ N/A
☐ Vegetation does not impede flow
Areal extent_____ Type_____
Remarks_____
_____

3. **Erosion** ☐ Location shown on site map ☐ Erosion not evident
Areal extent_____ Depth_____
Remarks_____
_____

4. **Discharge Structure** ☐ Functioning ☐ N/A
Remarks_____
_____

VIII. VERTICAL BARRIER WALLS ☐ Applicable ☒ N/A

1. **Settlement** ☐ Location shown on site map ☐ Settlement not evident
Areal extent_____ Depth_____
Remarks_____
_____

2. **Performance Monitoring** Type of monitoring_____
☐ Performance not monitored
Frequency_____ ☐ Evidence of breaching
Head differential_____
Remarks_____
_____

IX. GROUNDWATER/SURFACE WATER REMEDIES ☐ Applicable ☒ N/A

A. Groundwater Extraction Wells, Pumps, and Pipelines ☐ Applicable ☒ N/A

1. **Pumps, Wellhead Plumbing, and Electrical**
☐ Good condition ☐ All required wells properly operating ☐ Needs Maintenance ☐ N/A
Remarks_____
_____
_____

2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
☐ Good condition ☐ Needs Maintenance
Remarks_____
_____

3. **Spare Parts and Equipment**
☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided
Remarks_____
_____

B. Surface Water Collection Structures, Pumps, and Pipelines ☐ Applicable ☒ N/A

1. **Collection Structures, Pumps, and Electrical**
☐ Good condition ☐ Needs Maintenance
Remarks_____
_____

2. **Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
☐ Good condition ☐ Needs Maintenance
Remarks_____
_____

3. **Spare Parts and Equipment**
☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided
Remarks_____
_____

C. Treatment System ☐ Applicable ☒ N/A

1. **Treatment Train** (Check components that apply)
☐ Metals removal ☐ Oil/water separation ☐ Bioremediation
☐ Air stripping ☐ Carbon adsorbers
☐ Filters_____
☐ Additive (*e.g.*, chelation agent, flocculent)_____
☐ Others_____
☐ Good condition ☐ Needs Maintenance
☐ Sampling ports properly marked and functional
☐ Sampling/maintenance log displayed and up to date
☐ Equipment properly identified
☐ Quantity of groundwater treated annually_____
☐ Quantity of surface water treated annually_____
Remarks_____
_____

2. **Electrical Enclosures and Panels** (properly rated and functional)
☐ N/A ☐ Good condition ☐ Needs Maintenance
Remarks_____
_____

3. **Tanks, Vaults, Storage Vessels**
☐ N/A ☐ Good condition ☐ Proper secondary containment ☐ Needs Maintenance
Remarks_____
_____

4. **Discharge Structure and Appurtenances**
☐ N/A ☐ Good condition ☐ Needs Maintenance
Remarks_____
_____

5. **Treatment Building(s)**
☐ N/A ☐ Good condition (esp. roof and doorways) ☐ Needs repair
☐ Chemicals and equipment properly stored
Remarks_____
_____

6. **Monitoring Wells** (pump and treatment remedy)
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ All required wells located ☐ Needs Maintenance ☐ N/A
Remarks_____
_____

D. Monitoring Data

1. Monitoring Data
   ☒ Is routinely submitted on time ☒ Is of acceptable quality

2. Monitoring data suggests:
   ☒ Groundwater plume is effectively contained ☒ Contaminant concentrations are declining

E. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)
   ☒ Properly secured/locked ☒ Functioning ☒ Routinely sampled ☒ Good condition
   ☒ All required wells located ☐ Needs Maintenance ☐ N/A
   Remarks_____
   _____

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS (see text of FYR report for overall observations)

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

_____
_____
_____
_____
_____
_____
_____
_____
_____

C.	Early Indicators of Potential Remedy Problems
	Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future. _____ _____ _____ _____ _____ _____ _____ _____ _____
D.	**Opportunities for Optimization**
	Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. _____ _____ _____ _____ _____ _____ _____ _____ _____

APPENDIX D –
INSTITUTIONAL CONTROL PARCEL DESCRIPTIONS AND MAPS

DECLARATION OF RESTRICTIONS

AND COVENANTS

THIS DECLARATION, made this 6th day of October, 1995, by Ruth Kummer, (hereinafter referred to as "Declarant"):

WITNESSETH:

WHEREAS, Declarant is the fee owner of the real property legally described herein; and

WHEREAS, Declarant entered into a Landfill Cleanup Agreement on October 16, 1995, with the Commissioner of the Minnesota Pollution Control Agency pursuant to the Landfill Cleanup Act, Minn. Stat. §§ 115B.39-115B.46 (1994) (the "Act"), related to the Kummer Sanitary Landfill which Declarant owns and which is located in Section 32, Township 147N, Range 33W, Northern Township, Beltrami County, Minnesota; and

WHEREAS, under the Landfill Cleanup Agreement, Declarant agreed to place a Restrictive Covenant on portions of certain parcels of property that they own and which are hereinafter described.

NOW THEREFORE, Declarant makes the following declarations as to limitations, restrictions and uses to which the subject property may be put, and specifies that such declarations shall constitute covenants to run with the land as provided by law and shall be binding on all parties and all persons claiming under them.

1. There shall be no construction of any structure without the written approval of the Commissioner of the Minnesota Pollution Control Agency (MPCA) on the following described parcels of property:

DESCRIPTION OF TOTAL AREA INSIDE OF FENCE

That part of the West Half of the Northeast Quarter, Section 32, Township 147 North, Range 33 West of the 5th Principal Meridan described as follows:

Commencing at the Southeast corner of said West Half of the Northeast Quarter; thence North 88 degrees 39 minutes 08 seconds West (assumed bearing) along the South line of

said Northeast Quarter a distance of 322.95 feet; thence North 02 degrees 49 minutes 17 seconds West a distance of 42.12 feet to the point of beginning of the land to be described; thence North 88 degrees 41 minutes 26 seconds West a distance of 1005.71 feet; thence North 00 degrees 47 minutes 09 seconds East a distance of 1362.76 feet; thence North 37 degrees 50 minutes 20 seconds East a distance of 250.89 feet; thence South 89 degrees 55 minutes 17 seconds East a distance of 969.66 feet; thence South 44 degrees 43 minutes 39 seconds East a distance of 219.40 feet; thence South 00 degrees 00 minutes 07 seconds East a distance of 864.75 feet; thence North 89 degrees 46 minutes 15 seconds West a distance of 318.98 feet; thence South 02 degrees 49 minutes 17 seconds East a distance of 563.76 feet to the point of beginning. Enclosing an area of 41.92 acres.

DESCRIPTION OF ROAD PARCEL TO NORTH 40

That part of the Southwest Quarter of the Northeast Quarter, Section 32, Township 147 North, Range 33 West of the 5th Principal Meridian described as follows:

Commencing at the Southeast corner of said Southwest Quarter of the Northeast Quarter; thence North 00 degrees 23 minutes 10 seconds East (assumed bearing) along the East line of said Southwest Quarter of the Northeast Quarter a distance of 611.32 feet to the point of beginning of the land to be described; thence North 89 degrees 46 minutes 15 seconds West a distance of 37.82 feet; thence North 00 degrees 00 minutes 07 seconds West a distance of 718.55 feet; thence South 88 degrees 16 minutes 41 seconds East a distance of 42.70 feet to the East line of said Southwest Quarter of the Northeast Quarter; thence South 00 degrees 23 minutes 10 seconds West along the East line of said Southwest Quarter of the Northeast Quarter a distance of 717.44 feet to the point of beginning. Enclosing an area of 0.66 acres.

2. There shall be no construction of any structure within 100 feet of the landfill fence without the written approval of the Commissioner of the MPCA on the following described parcels of property:

DESCRIPTION OF KUMMER'S HOUSE PARCEL

That part of the Southwest Quarter of the Northeast Quarter, Section 32, Township 147 North, Range 33 West of the 5th Principal Meridan described as follows:

Beginning at the Southeast corner of said Southwest Quarter of the Northeast Quarter; thence North 88 degrees 39 minutes 08 seconds West (assumed bearing) along the South line of said Southwest Quarter of the Northeast Quarter a distance of 322.95 feet; thence North 02 degrees 49 minutes 17 seconds West a distance of 605.88 feet; thence South 89 degrees 46 minutes 15 seconds East a distance of 356.80 feet to the East line of said Southwest Quarter of the Northeast Quarter; thence South 00 degrees 23 minutes 10 seconds West along the East line of said Southwest Quarter of the Northeast Quarter a distance of 611.32 feet to the point of beginning. Less the South 33.00 feet thereof. Enclosing an area of 4.50 acres.

The remaining property owned by Ruth Kummer in the Northwest Quarter of the Northeast Quarter of Section 32, Township 147N, Range 33 W, Northern Township, Beltrami County, Minnesota.

3. Drinking water wells may only be installed in compliance with Minn. R. 4725.4450 and any amendments thereto and only after the written approval of the Commissioner of the MPCA and the Minnesota Department of Health on the following described parcels of property:

West half of the Northeast Quarter, Section 32, Township 147N, Range 33W, Northern Township, Beltrami County, Minnesota

4. When the MPCA Commissioner determines that a Restrictive Covenant is no longer necessary to carry out his duties or authorities under the Act or to protect public health, welfare or the environment, the Commissioner may terminate this declaration and release all or a portion of the affected property from all or any part of the terms and conditions of this declaration according to the terms found in Paragraph I.3. of the Binding Agreement between Charles, Ruth and Jon Kummer and the Commissioner.

IN WITNESS WHEREOF, the undersigned being the Declarant herein has caused this declaration to be executed on the day and year first above written.

/Ruth C. Kummer

<Name>

ACKNOWLEDGMENT

STATE OF MINNESOTA

COUNTY OF Beltrami

On this 6th day of October, 1995, before me a notary public within and for said County and State, personally appeared Ruth Kummer to me personally known, who, being duly sworn by me on oath, did say that she is the person who signed the foregoing instrument and acknowledged that they signed the same as free act and deed for the uses and purposes therein set forth.

Betty Lou Olson

Notary Public, _____ County, MN

My commission expires _____

BETTY LOU OLSON
NOTARY PUBLIC-MINNESOTA
BELTRAMI COUNTY
My Comm. Expires Jan. 31, 2000

Accepted by the Commissioner of
the Minnesota Pollution Control Agency
pursuant to Minn. Stat. §§ 115B.412, subd. 3
and 115B.17, subd. 15

By _____
Gary A. Pulford
Delegee of the Commissioner

ACKNOWLEDGMENT

STATE OF MINNESOTA

COUNTY OF RAMSEY

On this 12 day of Oct, 19 95, before me a notary public within and for said County and State, personally appeared Gary A. Pulford, Delegee of the Commissioner of the Minnesota Pollution Control Agency, to me personally known, who being duly sworn by me on oath, did say that he is the person who signed the foregoing instrument and acknowledged that he signed said instrument as the free act and deed of the State of Minnesota.

_____
Notary Public, Ramsey County, MN
My commission expires Jan. 31, 2000

THIS INSTRUMENT WAS DRAFTED BY:

Kathleen Winters
Assistant Attorney General
900 NCL Tower
445 Minnesota Street
St. Paul, Minnesota 55101

PATRICIA A. KOSHENINA
NOTARY PUBLIC - MINNESOTA
RAMSEY COUNTY
My Commission Expires Jan. 31, 2000

Return to MPCA
Attn: Douglas Wetzstein
520 Lafayette Rd
St Paul, MN 55155-3898

18

11:00

359382

OFFICE OF COUNTY RECORDER
Beltrami County, Minnesota

I hereby certify that this instrument was filed in this office for record on the 18th day of October A.D. 19 95 at 11:00 o'clock A M. and was duly recorded by Microfilm No. 359382

Ann F. Allen
COUNTY RECORDER

DEPUTY

Indexed -
Traced -
Platted -
Compared -

PATRICIA A. ROSENBERG
NOTARY PUBLIC - MINNESOTA
RAMSEY COUNTY
My Commission Expires Jan. 31, 2000

26-
4.50-
(Ruth Kummer, 901 Anne St NW Bemidji)

Northern Township
Special Well and Boring Construction Area

A Well Advisory was issued on August 12, 1991, for an area in portions of Northern Township, Beltrami County.

The surficial aquifer within much of the well advisory area has been contaminated with leachate from Kummer Sanitary Landfill. The Kummer landfill is listed on the U.S Environmental Protection Agency National Priorities List (superfund). The Landfill began operation in 1971. In 1982 and 1983, contamination was found in residential wells to the southeast of the site. Studies conducted as part of the remedial investigation show that ground water flow is to the east, and that the contaminants are moving with the ground water. Most of the contaminants are volatile organic chemicals; vinyl chloride is the predominant compound of concern.

An alternative water supply (connection to a municipal distribution system) has been provided for residents of the area of contaminated ground water.

The special well and boring construction area is bounded on the north by Fern Street and the section line between sections 28 and 33. The southern boundary is defined by a line running due west from the intersection of 35th Street Northwest and Irvine Avenue Northwest to the North Country Regional Hospital, Irvine Avenue Northwest between 35th Street Northwest and Algoma Street Northwest, and a line running due east from the intersection of Irvine Avenue Northwest and Algoma Street Northwest to Lake Bemidji. The eastern boundary is defined by Lake Bemidji. The western boundary is defined by a north-south line set 500 feet to the west of Greenleaf Avenue Northwest. (Note: The southern boundary has been changed to reflect changes in street names. The original Well Advisory of August 12, 1991, described the southern boundary as: Rose Street and a line running due west from Rose Street to the North County Hospital, 34th street Northwest, and a line extending due east from 34th Street Northwest to Lake Bemidji.)

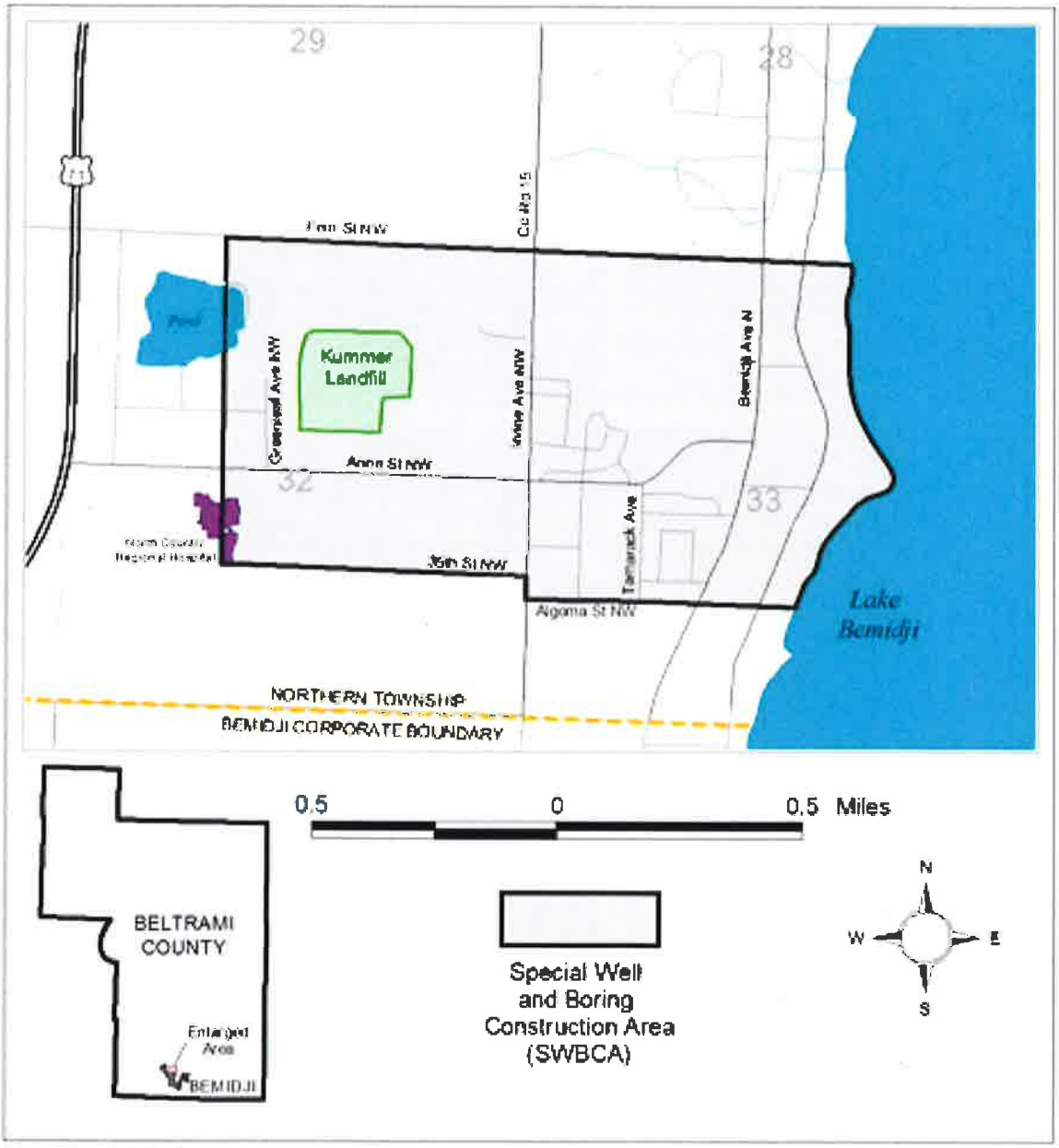
The geology of the site consists of a fine sand layer to approximately 20 feet, discontinuous sand and gravel lenses and silty or clay lenses at depths of approximately 30 to 45 feet. These lenses act locally as confining layers. To the east of the landfill the groundwater gradient is towards the land surface. Contaminants appear to be limited to the upper 60 feet. The water table is at approximately 18 to 20 feet. The general groundwater flow direction and contaminant plume movement is east toward lake Bemidji.

The requirements of the special well and boring construction area are:

1. Within the special construction area, the deepening of existing wells or the construction of any new types of wells, is prohibited until further notice. This ban includes the installation of shallow sand-point wells. The shallow wells are of particular concern because of the majority of the known contamination exists within the shallow aquifers (less than 40 feet in depth).

2. Wells other than domestic water wells, such as dewatering wells for construction purposes, will be considered on an individual basis and, if allowed, will require a variance from the Minnesota Department of Health (MDH).
3. It is recommended that the Minnesota Department of Health be contacted before the construction of any large capacity wells within one mile of the advisory area boundaries. These are wells with a drawdown capacity that could significantly alter the existing groundwater flow patterns. Examples of such wells are municipal, industrial, or dewatering wells. These wells usually require a groundwater appropriations permit from the Minnesota Department of Natural Resources (DNR).
4. Within the special well and boring construction area, any wells other than monitoring wells, with water found to currently contain, or have in the past, contained contamination levels exceeding the Minnesota Department of Health Recommended Allowable Limits (RALs) must be permanently sealed and abandoned by a licensed well contractor.
5. Within the special well and boring construction area, all wells located west of Tamarack Avenue Northwest and west of the line running due north of Tamarack Avenue Northwest must be sealed unless it can be shown in each individual well that the levels of contamination do not exceed RALs.
6. In the event of the sale of any property, or any other type of property title transfer within the entire special well and boring construction area, if there is an existing well on the property, the well water must be tested for contamination. If levels of contamination are found that exceed RALs, the well must be permanently sealed by a licensed well contractor.
7. In the future, the restrictions and boundaries of this special well and boring construction area may change. This would be based on the extent of changes in contamination levels and flow directions of the contaminant plume. The indicator chemicals chosen for study in this area include tetrachloroethene, trichloroethene, trans-1,2-dichloroethene, vinyl chloride, and benzene. Tetrachloroethene and vinyl chloride have already been found at levels exceeding the Minnesota Department of Health RALs in several wells, and are the most commonly found contaminants

Special Well and Boring Construction Area
Northern Township
Beltrami County



MINNESOTA MDH DEPARTMENT of HEALTH

Minnesota Department of Health - Well Management Section
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